NORTH CAROLINA VACCINE CIRCUS

"JUGGLING THE COMPLEXITY OF IMMUNIZATIONS"

2013 IMMUNIZATION CONFERENCE

NCPH
North Carolina Public Health

nc department of health and human services

Running Away with the Circus

- Immunization 101
- The Basics of Vaccine Administration
- Clinical refresher for new immunizers

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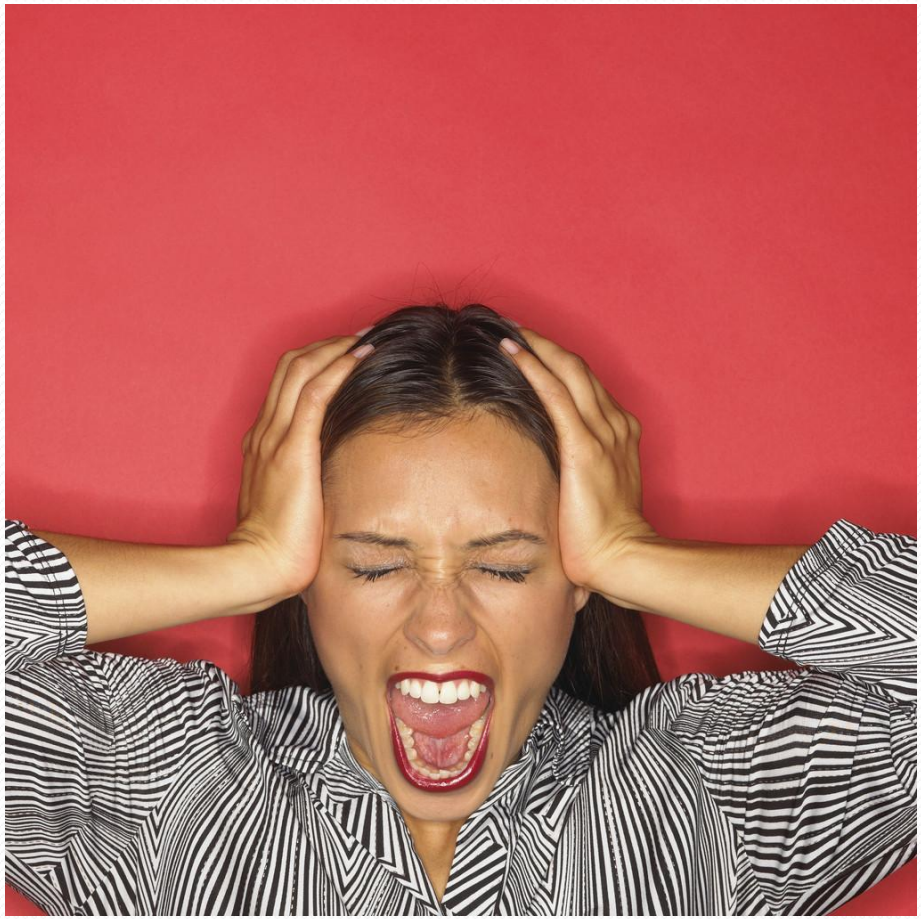
Regional Immunization Nurse Consultants

Let the Fun Begin



Impact of Vaccines in 20th Century

- Smallpox 48,164 → 0
- Diphtheria 175,885 → 0
- Pertussis 147,271 → 18,719
- Tetanus 1,314 → 36
- Polio (paralytic) 16,316 → 0
- Measles 503,282 → 222
- Mumps 152,209 → 404
- *Haemophilus influenzae* (<5 years) 20,000 (est) → 226
  (serotype B or unknown serotype)

Agenda

- Vaccine Issues
- Child Related Issues
- Documentation
- State Law and State Vaccine Program

Vaccine Issues

- Schedules
- Product Recognition
- Minimum Ages/Minimum Intervals
- Administration
- Storage/Handling

Recommended Schedule 2013

- By Vaccine
- By Ages

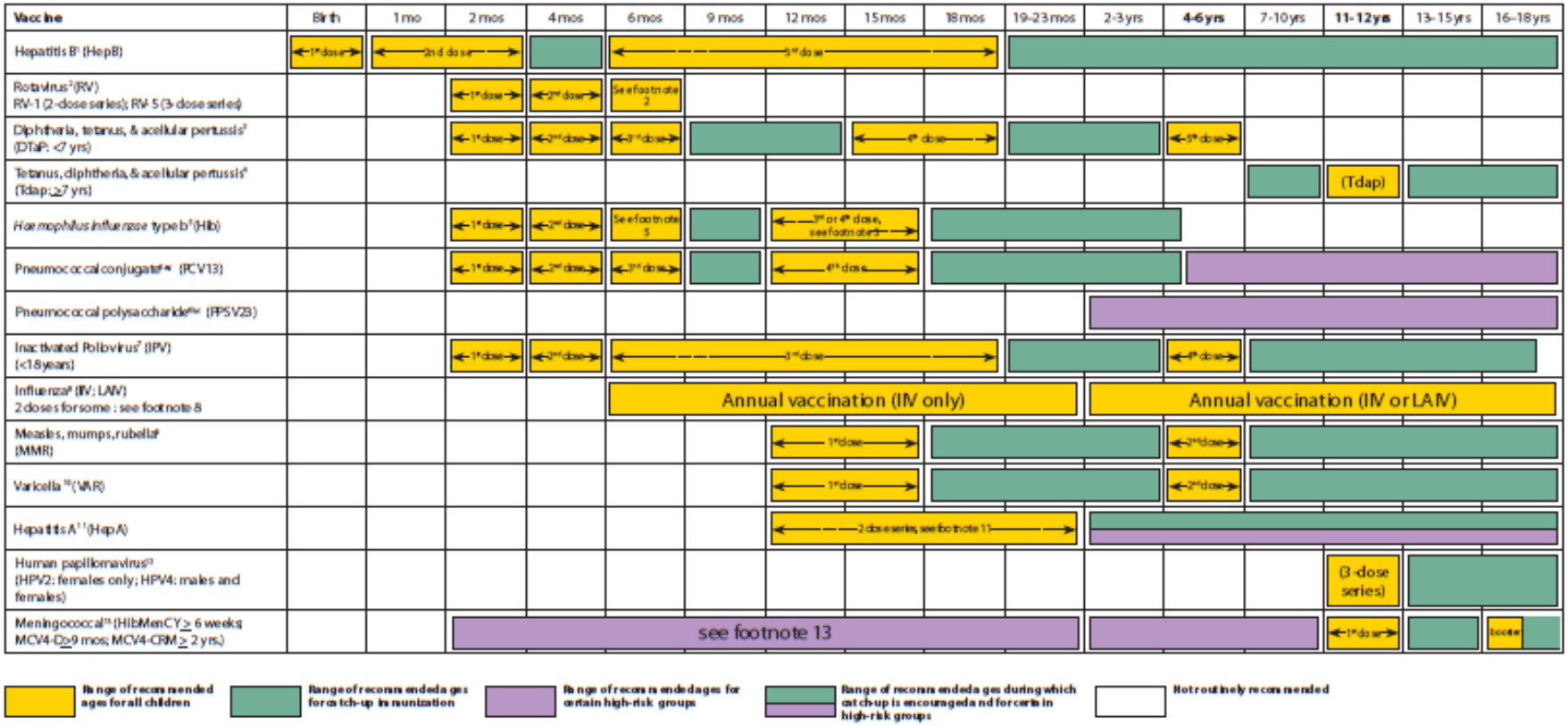
- Footnotes: Don't forget the footnotes.

  Always read

  Always heed

Figure 1. Recommended immunization schedule for persons aged 0 through 18 years – 2013.
(FOR THOSE WHO FALL BEHIND OR START LATE, SEE THE CATCH-UP SCHEDULE [FIGURE 2]).

These recommendations must be read with the footnotes that follow. For those who fall behind or start late, provide catch-up vaccination at the earliest opportunity as indicated by the green bars in Figure 1. To determine minimum intervals between doses, see the catch-up schedule (Figure 2). School entry and adolescent vaccine age groups are in bold.



This schedule includes recommendations in effect as of January 1, 2013. Any dose not administered at the recommended age should be administered at a subsequent visit, when indicated and feasible. The use of a combination vaccine generally is preferred over separate injections of its equivalent component vaccines. Vaccination providers should consult the relevant Advisory Committee on Immunization Practices (ACIP) statement for detailed recommendations, available online at http://www.cdc.gov/vaccines/pubs/acip-list.htm. Clinically significant adverse events that follow vaccination should be reported to the Vaccine Adverse Event Reporting System (VAERS) online (http://www.vaers.hhs.gov) or by telephone (800-822-7967). Suspected cases of vaccine-preventable diseases should be reported to the state or local health department. Additional information, including precautions and contraindications for vaccination, is available from CDC online (http://www.cdc.gov/vaccines) or by telephone (800-CDC-INFO [800-232-4636]).

This schedule is approved by the Advisory Committee on Immunization Practices (http://www.cdc.gov/vaccines/acip/index.html), the American Academy of Pediatrics (http://www.aap.org), the American Academy of Family Physicians (http://www.aafp.org), and the American College of Obstetricians and Gynecologists (http://www.acog.org).

NOTE: The above recommendations must be read along with the footnotes of this schedule.

Catch-Up Schedule

- Children age 4 months through 6 years
- Children 7 years through 18 years

Catch-Up Schedule

FIGURE 2. Catch-up immunization schedule for persons aged 4 months through 18 years who start late or who are more than 1 month behind —United States • 2013

The figure below provides catch-up schedules and minimum intervals between doses for children whose vaccinations have been delayed. A vaccine series does not need to be restarted, regardless of the time that has elapsed between doses. Use the section appropriate for the child's age. Always use this table in conjunction with Figure 1 and the footnotes that follow.

Persons aged 4 months through 6 years					
Vaccine	Minimum Age for Dose 1	Minimum Interval Between Doses			
		Dose 1 to dose 2	Dose 2 to dose 3	Dose 3 to dose 4	Dose 4 to dose 5
Hepatitis B[1]	Birth	4 weeks	8 weeks and at least 16 weeks after first dose; minimum age for the final dose is 24 weeks		
Rotavirus[2]	6 weeks	4 weeks	4 weeks[2]		
Diphtheria, tetanus, pertussis[3]	6 weeks	4 weeks	4 weeks	6 months	6 months[3]
Haemophilus influenzae type b[4]	6 weeks	4 weeks if first dose administered at younger than age 12 months; 8 weeks (as final dose) if first dose administered at age 12–14 months; No further doses needed if first dose administered at age 15 months or older	4 weeks[4] if current age is younger than 12 months; 8 weeks (as final dose)[4] if current age is 12 months or older and first dose administered at younger than age 12 months and second dose administered at younger than 15 months; No further doses needed if previous dose administered at age 15 months or older	8 weeks (as final dose) This dose only necessary for children aged 12 through 59 months who received 3 doses before age 12 months	
Pneumococcal[5]	6 weeks	4 weeks if first dose administered at younger than age 12 months; 8 weeks (as final dose for healthy children) if first dose administered at age 12 months or older or current age 24 through 59 months; No further doses needed for healthy children if first dose administered at age 24 months or older	4 weeks if current age is younger than 12 months; 8 weeks (as final dose for healthy children) if current age is 12 months or older; No further doses needed for healthy children if previous dose administered at age 24 months or older	8 weeks (as final dose) This dose only necessary for children aged 12 through 59 months who received 3 doses before age 12 months or for children at high risk who received 3 doses at any age	
Inactivated poliovirus[7]	6 weeks	4 weeks	4 weeks	6 months[7] minimum age 4 years for final dose	
Meningococcal[13]	6 weeks	8 weeks[13]	see footnote 13	see footnote 13	
Measles, mumps, rubella[8]	12 months	4 weeks			
Varicella[10]	12 months	3 months			
Hepatitis A[11]	12 months	6 months			
Persons aged 7 through 18 years					
Tetanus, diphtheria; tetanus, diphtheria, pertussis[3]	7 years[3]	4 weeks	4 weeks if first dose administered at younger than age 12 months; 6 months if first dose administered at 12 months or older	6 months if first dose administered at younger than age 12 months	
Human papillomavirus[12]	9 years	Routine dosing intervals are recommended[12]			
Hepatitis A[11]	12 months	6 months			
Hepatitis B[1]	Birth	4 weeks	8 weeks (and at least 16 weeks after first dose)		
Inactivated poliovirus[7]	6 weeks	4 weeks	4 weeks[7]	6 months[7]	
Meningococcal[13]	6 weeks	8 weeks[13]			
Measles, mumps, rubella[8]	12 months	4 weeks			
Varicella[10]	12 months	3 months if person is younger than age 13 years; 4 weeks if person is aged 13 years or older			

Footnotes

Footnotes — Recommended Immunization schedule for persons aged 0 through 18 years—United States, 2013

For further guidance on the use of the vaccines mentioned below, see: http://www.cdc.gov/vaccines/pubs/ACIP-list.htm.

1. **Hepatitis B (HepB) vaccine. (Minimum age: birth)**
   Routine vaccination:
   At birth
   - Administer monovalent HepB vaccine to all newborns before hospital discharge.
   - For infants born to hepatitis B surface antigen (HBsAg)–positive mothers, administer HepB vaccine and 0.5 mL of hepatitis B immune globulin (HBIG) within 12 hours of birth. These infants should be tested for HBsAg and antibody to HBsAg (anti-HBs) 1 to 2 months after completion of the HepB series, at age 9 through 18 months (preferably at the next well-child visit).
   - If mother's HBsAg status is unknown, within 12 hours of birth administer HepB vaccine to all infants regardless of birth weight. For infants weighing <2,000 grams, administer HBIG in addition to HepB within 12 hours of birth. Determine mother's HBsAg status as soon as possible and, if she is HBsAg-positive, also administer HBIG for infants weighing ≥2,000 grams (no later than age 1 week).

   Doses following the birth dose
   - The second dose should be administered at age 1 or 2 months. Monovalent HepB vaccine should be used for doses administered before age 6 weeks.
   - Infants who did not receive a birth dose should receive 3 doses of a HepB-containing vaccine on a schedule of 0, 1 to 2 months, and 6 months starting as soon as feasible. See Figure 2.
   - The minimum interval between dose 1 and dose 2 is 4 weeks and between dose 2 and 3 is 8 weeks. The final (third or fourth) dose in the HepB vaccine series should be administered no earlier than age 24 weeks, and at least 16 weeks after the first dose.
   - Administration of a total of 4 doses of HepB vaccine is recommended when a combination vaccine containing HepB is administered after the birth dose.

   Catch-up vaccination:
   - Unvaccinated persons should complete a 3-dose series.
   - A 2-dose series (doses separated by at least 4 months) of adult formulation Recombivax HB is licensed for use in children aged 11 through 15 years.
   - For other catch-up issues, see Figure 2.
2. **Rotavirus (RV) vaccines. (Minimum age: 6 weeks for both RV-1 [Rotarix] and RV-5 [RotaTeq]).**
   Routine vaccination:
   - Administer a series of RV vaccine to all infants as follows:
     1. If RV-1 is used, administer a 2-dose series at 2 and 4 months of age.
     2. If RV-5 is used, administer a 3-dose series at ages 2, 4, and 6 months.
     3. If any dose in series was RV-5 or vaccine product is unknown for any dose in the series, a total of 3 doses of RV vaccine should be administered.

   Catch-up vaccination:
   - The maximum age for the first dose in the series is 14 weeks, 6 days.
   - Vaccination should not be initiated for infants aged 15 weeks 0 days or older.
   - The maximum age for the final dose in the series is 8 months, 0 days.
   - If RV-1(Rotarix) is administered for the first and second doses, a third dose is not indicated.
   - For other catch-up issues, see Figure 2.
3. **Diphtheria and tetanus toxoids and acellular pertussis (DTaP) vaccine. (Minimum age: 6 weeks)**
   Routine vaccination:
   - Administer a 5-dose series of DTaP vaccine at ages 2, 4, 6, 15–18 months, and 4 through 6 years. The fourth dose may be administered as early as age 12 months, provided at least 6 months have elapsed since the third dose.

   Catch-up vaccination:
   - The fifth (booster) dose of DTaP vaccine is not necessary if the fourth dose was administered at age 4 years or older.
   - For other catch-up issues, see Figure 2.
4. **Tetanus and diphtheria toxoids and acellular pertussis (Tdap) vaccine. (Minimum age: 10 years for Boostrix, 11 years for Adacel).**
   Routine vaccination:
   - Administer 1 dose of Tdap vaccine to all adolescents aged 11 through 12 years.
   - Tdap can be administered regardless of the interval since the last tetanus and diphtheria toxoid-containing vaccine.
   - Administer one dose of Tdap vaccine to pregnant adolescents during each pregnancy (preferred during 27 through 36 weeks gestation) regardless of number of years from prior Td or Tdap vaccination.

   Catch-up vaccination:
   - Persons aged 7 through 10 years who are not fully immunized with the childhood DTaP vaccine series, should receive Tdap vaccine as the first dose in the catch-up series; if additional doses are needed, use Td vaccine. For these children, an adolescent Tdap vaccine should not be given.
   - Persons aged 11 through 18 years who have not received Tdap vaccine should receive a dose followed by tetanus and diphtheria toxoids (Td) booster doses every 10 years thereafter.
   - An inadvertent dose of DTaP vaccine administered to children aged 7 through 10 years can count as part of the catch-up series. This dose can count as the adolescent Tdap dose, or the child can later receive a Tdap booster dose at age 11–12 years.
   - For other catch-up issues, see Figure 2.
5. ***Haemophilus influenzae* type b (Hib) conjugate vaccine. (Minimum age: 6 weeks)**
   Routine vaccination:
   - Administer a Hib vaccine primary series and a booster dose to all infants. The primary series doses should be administered at 2, 4, and 6 months of age; however, if PRP-OMP (PedvaxHib or Comvax) is administered at 2 and 4 months of age, a dose at age 6 months is not indicated. One booster dose should be administered at age 12 through15 months.
   - Hiberix (PRP-T) should only be used for the booster (final) dose in children aged 12 months through 4 years, who have received at least 1 dose of Hib.

   Catch-up vaccination:
   - If dose 1 was administered at ages 12-14 months, administer booster (as final dose) at least 8 weeks after dose 1.
   - If the first 2 doses were PRP-OMP (PedvaxHIB or Comvax), and were administered at age 11 months or younger, the third (and final) dose should be administered at age 12 through 15 months and at least 8 weeks after the second dose.
   - If the first dose was administered at age 7 through 11 months, administer the second dose at least 4 weeks later and a final dose at age 12 through 15 months, regardless of Hib vaccine (PRP-T or PRP-OMP) used for first dose.
   - For unvaccinated children aged 15 months or older, administer only 1 dose.
   - For other catch-up issues, see Figure 2.

   Vaccination of persons with high-risk conditions:
   - Hib vaccine is not routinely recommended for patients older than 5 years of age. However one dose of Hib vaccine should be administered to unvaccinated or partially vaccinated persons aged 5 years or older who have leukemia, malignant neoplasms, anatomic or functional asplenia (including sickle cell disease), human immunodeficiency virus (HIV) infection, or other immunocompromising conditions.

6a. **Pneumococcal conjugate vaccine (PCV). (Minimum age: 6 weeks)**
   Routine vaccination:
   - Administer a series of PCV13 vaccine at ages 2, 4, 6 months with a booster at age 12 through 15 months.
   - For children aged 14 through 59 months who have received an age-appropriate series of 7-valent PCV (PCV7), administer a single supplemental dose of 13-valent PCV (PCV13).

   Catch-up vaccination:
   - Administer 1 dose of PCV13 to all healthy children aged 24 through 59 months who are not completely vaccinated for their age.
   - For other catch-up issues, see Figure 2.

   Vaccination of persons with high-risk conditions:
   - For children aged 24 through 71 months with certain underlying medical conditions (see footnote 6c), administer 1 dose of PCV13 if 3 doses of PCV were received previously, or administer 2 doses of PCV13 at least 8 weeks apart if fewer than 3 doses of PCV were received previously.
   - A single dose of PCV13 may be administered to previously unvaccinated children aged 6 through 18 years who have anatomic or functional asplenia (including sickle cell disease), HIV infection or an immunocompromising condition, cochlear implant or cerebrospinal fluid leak. See MMWR 2010;59 (No. RR-11), available at http://www.cdc.gov/mmwr/pdf/rr/rr5911.pdf.
   - Administer PPSV23 at least 8 weeks after the last dose of PCV to children aged 2 years or older with certain underlying medical conditions (see footnotes 6b and 6c).

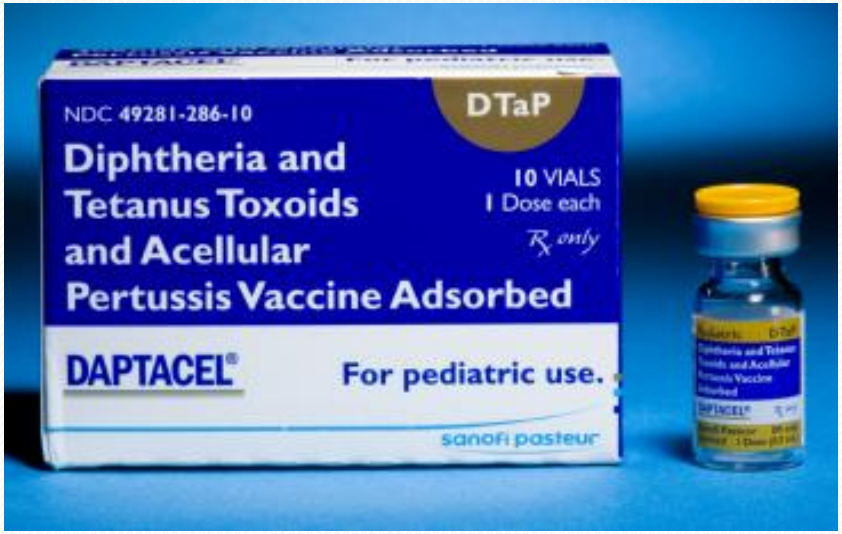
6b. **Pneumococcal polysaccharide vaccine (PPSV23). (Minimum age: 2 years)**
   Vaccination of persons with high-risk conditions:
   - Administer PPSV23 at least 8 weeks after the last dose of PCV to children aged 2 years or older with certain underlying medical conditions (see footnote 6c). A single revaccination with PPSV should be administered after 5 years to children with anatomic or functional asplenia (including sickle cell disease) or an immunocompromising condition.

6c. **Medical conditions for which PPSV23 is indicated in children aged 2 years and older and for which use of PCV13 is indicated in children aged 24 through 71 months:**
   - Immunocompetent children with chronic heart disease (particularly cyanotic congenital heart disease and cardiac failure); chronic lung disease (including asthma if treated with high-dose oral corticosteroid therapy), diabetes mellitus; cerebrospinal fluid leaks; or cochlear implant.
   - Children with anatomic or functional asplenia (including sickle cell disease and other hemoglobinopathies, congenital or acquired asplenia, or splenic dysfunction);
   - Children with immunocompromising conditions: HIV infection, chronic renal failure and nephrotic syndrome, diseases associated with treatment with immunosuppressive drugs or radiation therapy, including malignant neoplasms, leukemias, lymphomas and Hodgkin disease; or solid organ transplantation, congenital immunodeficiency.

Latest Age and Age Restrictions

HiB	Age 5 years
PCV13	Age 5 years
DTaP	Age 7 years
DT	Age 7 years
Polio	Age <18 years (US resident)
Td	Not before age 7 years
Tdap	Not before age 7 years

Vaccine Issues: Products Diphtheria/Tetanus



- DTaP
- DT
- Td
- Tdap: Boostrix,
  Adacel
- Combination Vaccines: Pentacel, Pediarix, and Kinrix

Vaccine Issues: Products

- HiB
  Hep
- Polio
  ppd
- PCV 13
  PPSV 23
- MCV-4
  MPSV-4
- DTap
  Tdap

Vaccine Issues: Minimum Age

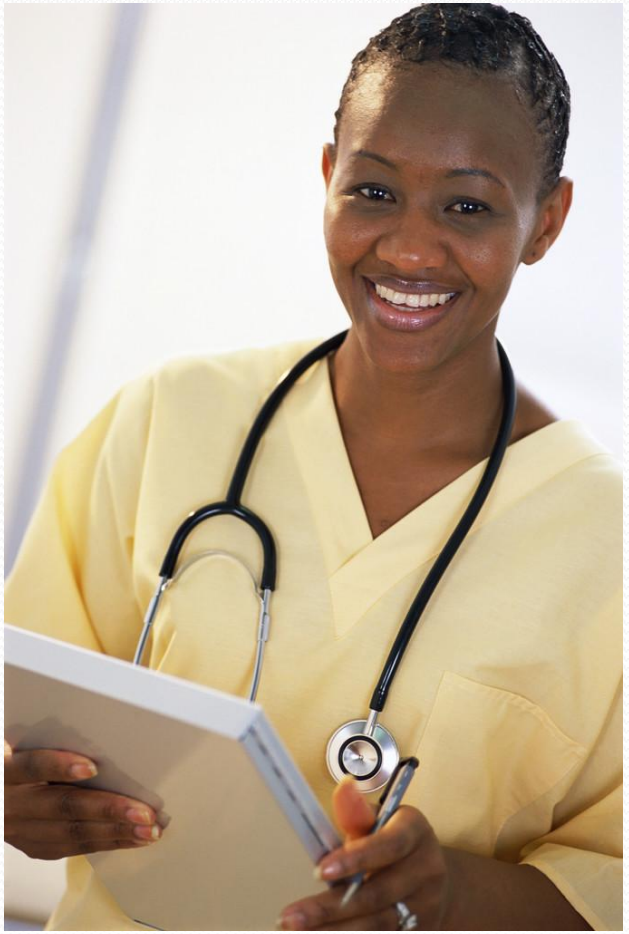
- At Birth
- At 4 weeks
- At 6 weeks-the case for HiB
- Live Virus Vaccines-MMR
  Varicella
  Rotavirus

Vaccine Issues: Minimum Intervals

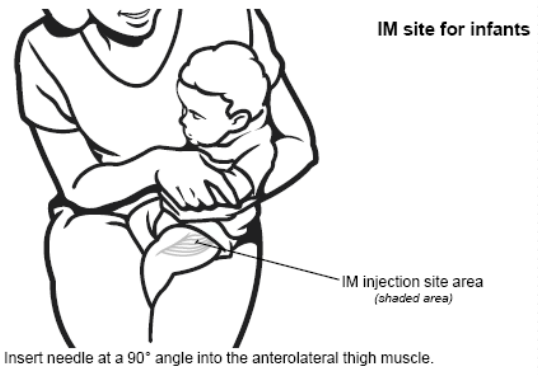
- Recommended Minimum Intervals
- Interval between IG/Blood and Live Virus Vaccines
- Diphtheria/Tetanus containing vaccines-no more than 6 by 7
- Interval between MMR and ppd if not administered same day
- Pregnancy and Live Virus Vaccines

Vaccine Issues: Administration

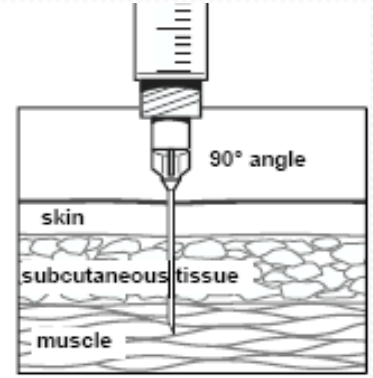
- Standing Orders
  - For RNs
  - For LPNs



Vaccine Issues: Administration

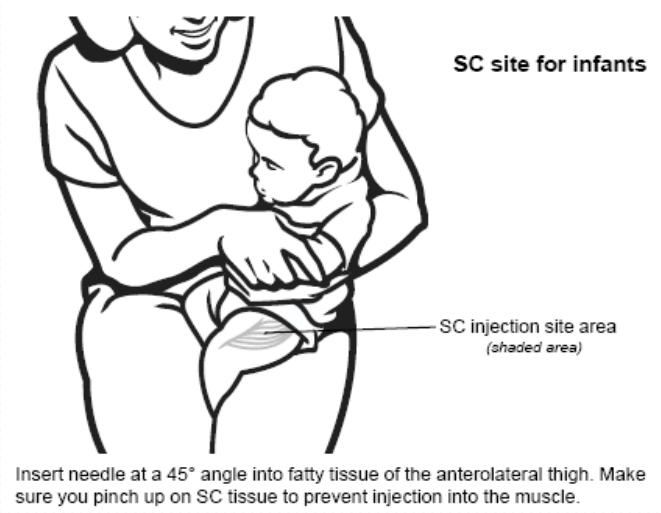


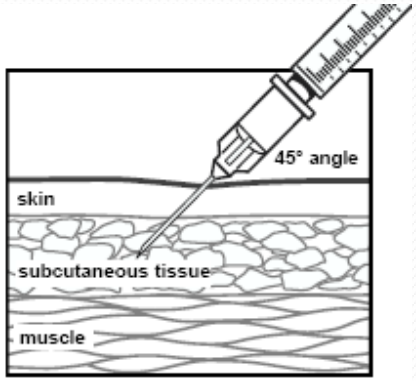
- Anatomical Sites
  - Legs
  - Arms
  - Separation



Vaccine Issues: Administration

- Intramuscular Injections:
  - Infants
  - Toddlers
  - Older Child
- Subcutaneous Injections:
  - Infants
  - Toddlers
  - Older Child

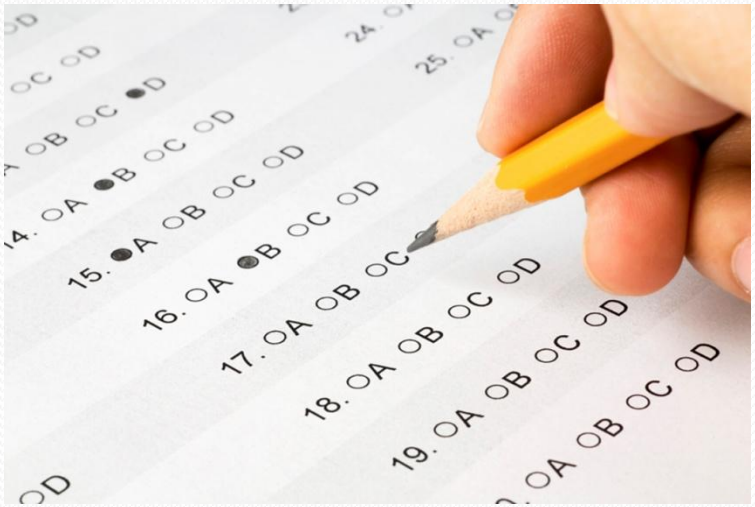




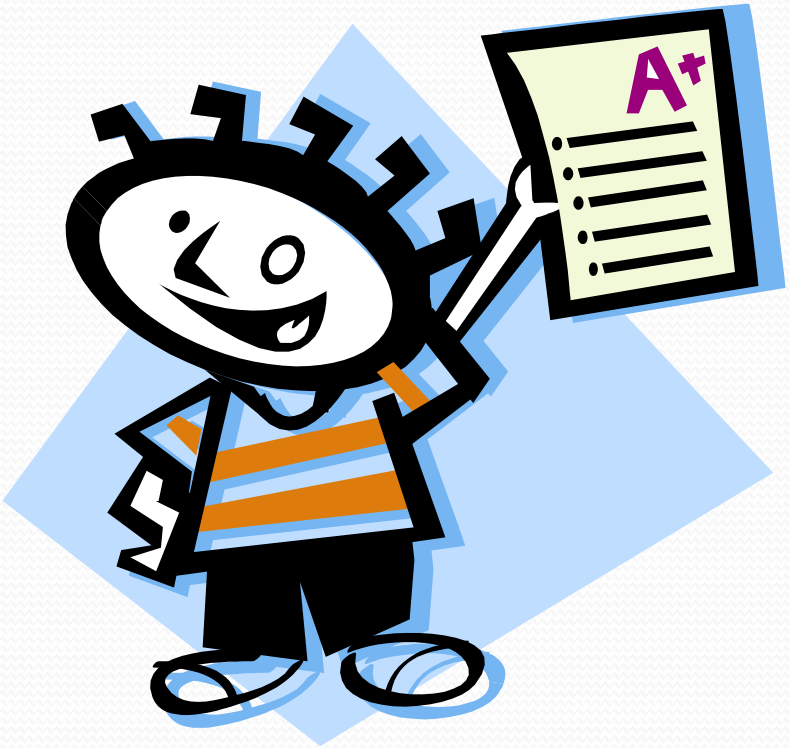
Pop Test

- What is the appropriate size needle length to use when administering an IM injection to an infant greater than 1 month?

- A- 5/8 inch
- B- 7/8 inch
- C 1 inch
- D Whatever is in the drawer

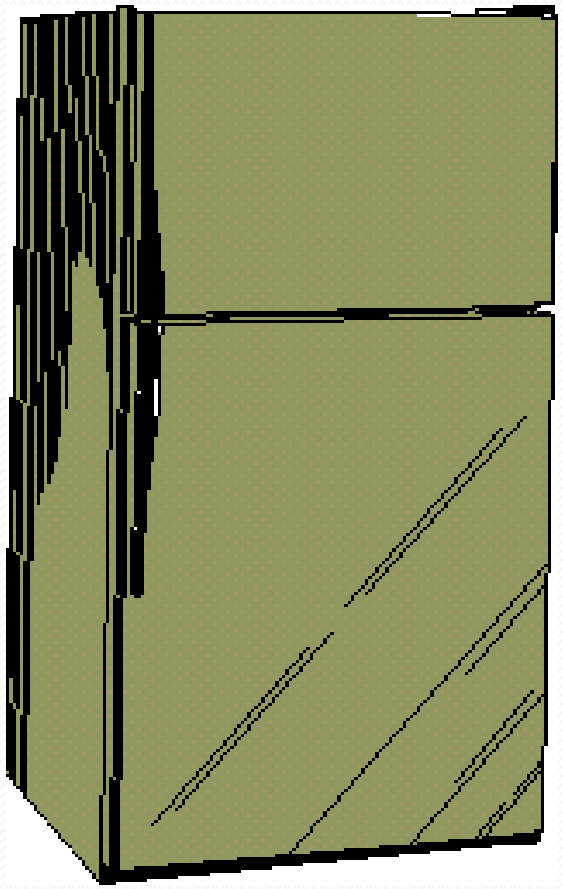


C: 1 inch

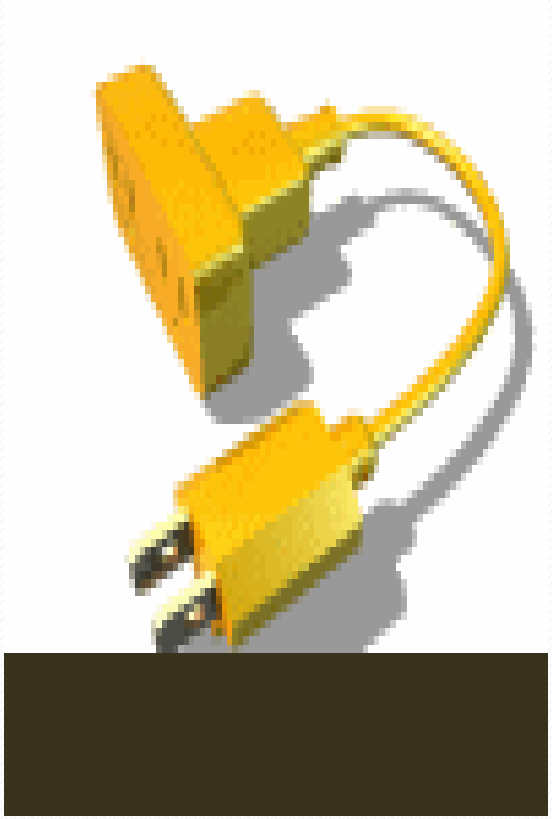


Vaccine Issues: Handling

- Diluents
- Prefilled syringes
- Mixing vaccines
- Expiration dates



Vaccine Issues: Storage



- Temperatures
- Light
- Clinic Settings
- Disaster

What is Wrong??

Dormitory-style (or bar-style) combined refrigerator/freezer units should NOT be used for any storage of any vaccine.

Better?

Deli drawers removed

Avoid storage on top shelf near cooling vent unless unit is a freezerless unit.

Place vaccines in original packaging in storage trays in center fridge space 2 to 3 inches from wall.

Water bottles to help stabilize temperature

Vaccines and diluent should not be stored near the floor or in the deli, fruit, or vegetable drawers because the temperature in these areas is different from that in the body of the refrigerator.

Child Related Issues

- Contraindications
- Teaching/Counseling
- After Care
- Emergency Care

Contraindications

- "Guide to Contraindications and Precautions for Childhood Vaccinations"

  www.cdc.gov/vaccines

- "Screening Questionnaire for Child and Teen Immunization"

  www.immunize.org

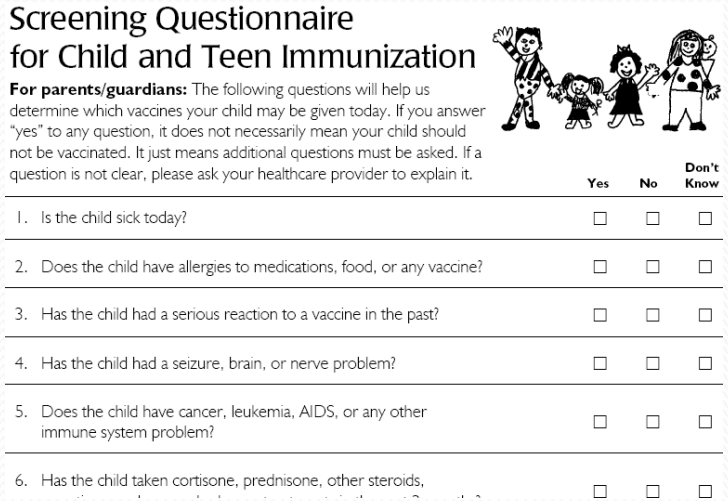
- **Package Inserts**

Contraindications

- State Law and medical exemptions
- Screening tools

Contraindications

- Check and Double Check
- National Immunization Screening Questionnaire



Screening Questionnaire for Child and Teen Immunization

For parents/guardians: The following questions will help us determine which vaccines your child may be given today. If you answer "yes" to any question, it does not necessarily mean your child should not be vaccinated. It just means additional questions must be asked. If a question is not clear, please ask your healthcare provider to explain it.

	Yes	No	Don't Know
1. Is the child sick today?	☐	☐	☐
2. Does the child have allergies to medications, food, or any vaccine?	☐	☐	☐
3. Has the child had a serious reaction to a vaccine in the past?	☐	☐	☐
4. Has the child had a seizure, brain, or nerve problem?	☐	☐	☐
5. Does the child have cancer, leukemia, AIDS, or any other immune system problem?	☐	☐	☐
6. Has the child taken cortisone, prednisone, other steroids,	☐	☐	☐

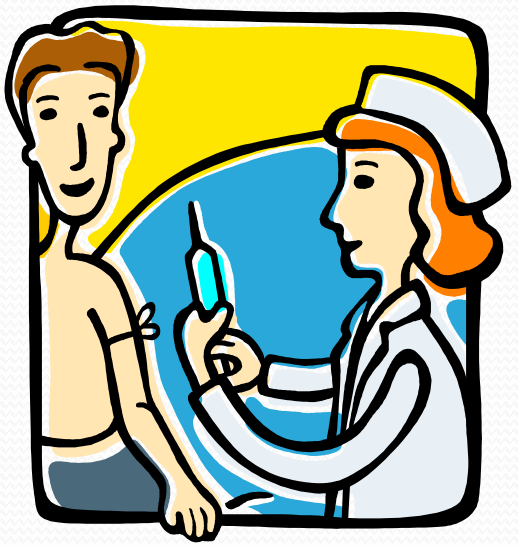
Teaching and Counseling

- Risks vs Benefits

  www.vaccinesafety.edu
- Adverse Reactions

  http://vaers.hhs.gov
- Law Requirements

  www.immunizenc.com



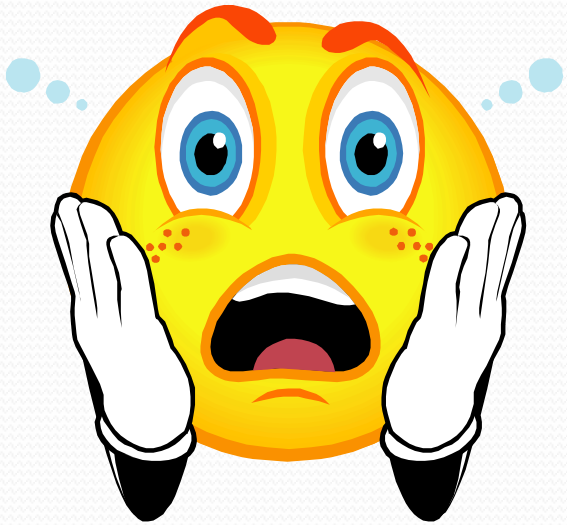
After Care

- Wait or not to Wait?
- Analgesics?
- Adverse reactions
  - Parent: call provider
  - Provider: notify VAERS

Adverse Reactions

- Emergency Care
  - Protocols
  - Epinephrine
  - Benadryl

Administration Errors



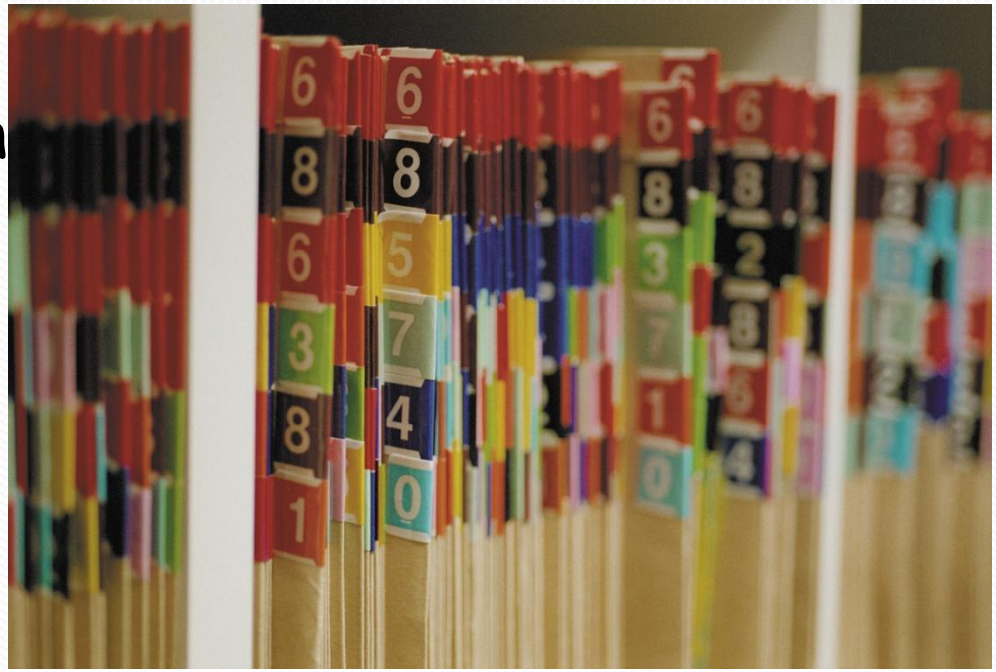
- Don't Panic
- Inform parent of potential side effects and/or need for revaccination at a later time.
- Document the dose

Documentation Issues

- Permanent Medical Record
- Certificate of Immunization

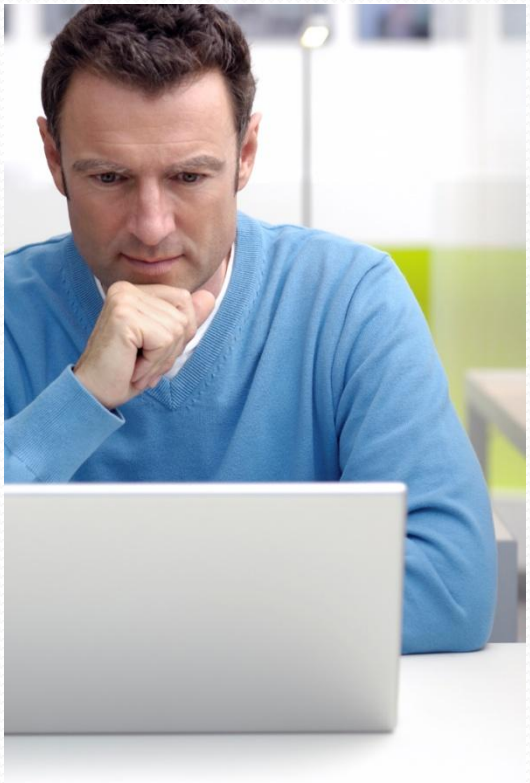
Permanent Medical Record

- Patient identification
- Vaccine Name
- Date of Administration
- Manufacturer
- Lot Number
- Site (Anatomical)
- Immunizer
- VIS offered
- VIS publication date
- Route



Documentation-continued

- Certificate of Immunization
- Vaccine Administration Log (VAL)
- NC Immunization Registry (NCIR)



Importance of Vaccine Histories

Historical Record Sources

- Provider's Office(s)
- Parent's Records
- NCIR
- School Records

Vaccine Issues: State Law

- NC General Statues

  www.ncleg.net/Statutes/statutes.asp

- NC Administrative Code "The Rules"

  http://ncrules.state.nc.us

State Law

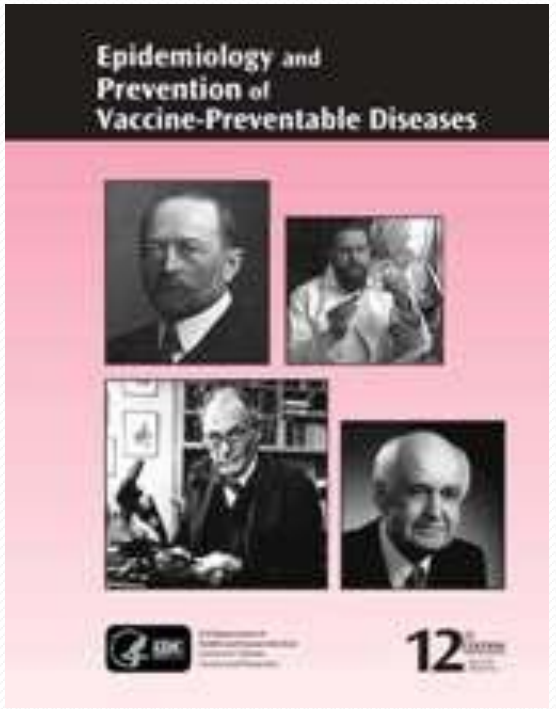
- Follow ACIP Recommended Childhood Schedule
- Requires Certificate of Immunization presented for Child Care/School enrollment

NCIP

- Follows current medical recommendations of ACIP
- Requires Safeguarding of Vaccines
- Requires Fiscal Accountability

Additional Resources

- Immunization Works
- CDC's Pink Book
- AAP's Red Book



Additional Resources: continued

- DVDs:
  - Immunization Techniques: Safe, Effective, Caring

Additional Resources: continued

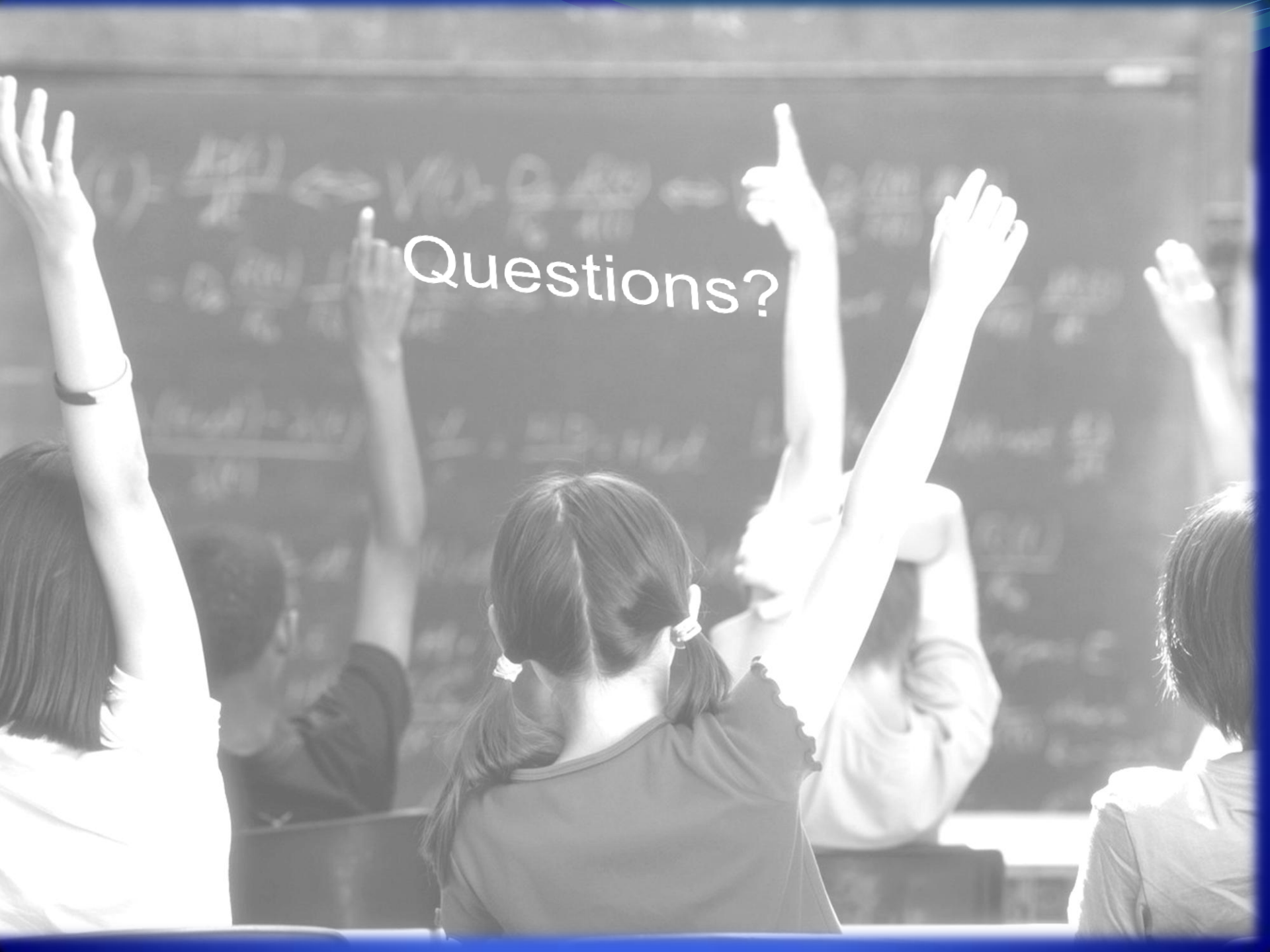
- North Carolina Immunization Branch Website: www.immunize.nc.gov
- CDC/National Immunization Program (NIP):http://www.cdc.gov/vaccines/
- Immunization Action Coalition: www.immunize.org

Additional Resources: continued

- ACIP Recommendations
  - General Recommendations
  - Vaccine by Vaccine

Additional Resources: continued

- Regional Immunization Nurse Consultants


Questions?